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dred on one of the streets over which a part of the course was laid. This, if it constituted any large part of the whole, would naturally increase the work performed, but apparently the greater part of the course was over streets with very little grade.

Since accurate data regarding the grade of the entire course are not accessible, it has seemed best to compute the results in detail without trying to take it into account. The organizers of the contest were of the opinion that the grade mentioned made the 10-mile course equivalent, in its demands upon the men, to a level course of 15 miles. If such an assumption be made, it would mean an average energy expenditure of 1,706 calories for those who completed the test.

As a result of the Department of Agriculture experiments with the respiration calorimeter, it has been calculated that a man at ordinary work, such as that of a mason or a carpenter, expends in the performance of his daily work, at least 1,200 calories. This means that the average energy expenditure of the man in performing the work of a contest which lasted four hours was greater than the above value for a day's work.

From a single test and so limited data it would be manifestly unfair to draw sweeping deductions regarding the character of the food in its relation to endurance. It is nevertheless a fact that the four successful candidates who furnished data lived on the ordinary mixed diet of the average citizen, and from all the information collected the same was true of all who entered the contest. This contest is of interest on this account and also because the endurance feat undertaken is comparable with the ordinary forms of muscular work which pertain to usual vocations, and so may be fairly considered as furnishing some indication of the fitness of the subjects for successfully engaging in occupations involving manual labor.

The total number completing the trial of strength is small (6 out of 48) in proportion to the total number of entries, but the number (44) of those who carried the 100-pound weight for nearly one mile is large, while it

was not until the men had passed the judges' stand four times that the number of contestants dropped below 20.

It seems fair to conclude that the men who engaged in the contest were, as regards their food, their occupation and their general living conditions, representative of the very large group of our population who are living comfortably and meeting their daily obligations in a creditable manner, who are, in fact, living the average life of the average man, with its varied activities and interests.

In so far as the recorded data throw light on the subject, they indicate that the average man living the average life is capable of meeting body demands of considerable severity—a conclusion which perhaps few would question, but which it is interesting to consider in the light of numerical data.

C. F. LANGWORTHY

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THE USE OF ACID SOIL FOR RAISING SEEDLINGS OF THE MAYFLOWER, *EPIGAEA REPENS*

MAYFLOWER or trailing arbutus (*Epigaea repens*), probably the best beloved of all the wild flowers of the eastern United States, is rarely seen in cultivation. It usually does not survive transplanting. No evidence has yet been found that flowering plants have ever actually been raised from the seed.

The development of a system of cultivating the swamp blueberry (*Vaccinium corymbosum*), by the use of acid soils,¹ suggested that a similar method might succeed with trailing arbutus, because the two plants have the same natural habitat, and because a symbiotic root fungus similar to the beneficial and probably indispensable root fungus of the blueberry was found to occur on trailing arbutus.

Seeds were procured in New Hampshire in July, 1909. They were sown in a mixture of kalmia peat, sand, and sphagnum. They germinated in August. After successive trans-

¹“Experiments in Blueberry Culture,” 1910 (Bulletin 193, Bureau of Plant Industry, Department of Agriculture).

plantings in an acid soil consisting of nine parts kalmia peat, by bulk, and one part clean sand, the plants in August, 1910, began to form their flowering buds. The larger plants then more than filled a five-inch pot. They were left outdoors during the winter, were brought into a cool greenhouse in March, and in a few days were in full flower. The plants were remarkably beautiful. The flowers had the characteristic color and fragrance of wild ones and were of unusual size, the largest corolla having a spread of seven eighths of an inch. The foliage was free from insect and other injuries to an extent seldom seen in wild plants.

Plants kept in a greenhouse all winter flowered only sparingly, but they furnished an opportunity for the observation of the fruit. The fruit of trailing arbutus is described in our standard works as a loculicidal capsule, but this description is incorrect, and must have been based on an erroneous deduction from immature specimens or imperfect remnants. The fully mature fruit is not a dry pod. It is as juicy as a strawberry. Its style of dehiscence is not loculicidal, but is that exactly if not melodiously described as "septicidally or rather marginicidally septicidal." In examples of perfect development the wall of the fruit while still green and herbaceous splits along the cell partitions into five valves, which spread backward into a five-pointed rosette, exposing the white, fleshy, succulent interior with the minute brown seeds dotted over its surface. The fleshy part, which looks like an unripe strawberry and is about a quarter of an inch in diameter, consists of the whole interior of the fruit, axis and dissepiments as well as placentæ. These observations as to the character of the fully developed fruit confirm the original observations made in New Hampshire in late July, 1909, at the very end of the fruiting season.

FREDERICK V. COVILLE

SOCIETIES AND ACADEMIES

THE TORREY BOTANICAL CLUB

THE meeting was held at the American Museum of Natural History. The meeting was called to

order at 8:15 P.M., with Dr. E. B. Southwick in the chair. Twenty-eight persons were present.

The scientific program consisted of a lecture on "Orchids, Wild and Cultivated," by Mr. Geo. V. Nash. The lecture was illustrated by a large number of beautiful lantern slides. An abstract of the lecture prepared by the speaker follows:

By the general public any odd or strange flower was considered an orchid, and as an illustration of this common error nepenthes and bromeliads were cited. The large division of endogenous plants to which the orchids belong was illustrated with a slide of the lily, this being taken as typical. Especial attention was called to the stamens and pistil which are distinct in this flower. As an illustration of a typical orchid flower a slide of *Cattleya* was shown. The uniting of the stamens and pistil into one organ, known as the column, was pointed out as the distinctive character of the orchid.

Another interesting feature is the diversity of the lip form. The lip is one of the petals. In some forms, such as *Odontoglossum*, it much resembles the other petals. In *Oncidium* it is markedly different in size and color; in *Cattleya* it becomes more modified by the inrolling of the base into a tube which surrounds the column; in *Dendrobium* a still greater modification occurs in the inrolling of the margins of the lip into a saccate organ; and in *Cypripedium* this tendency is greatly magnified, giving us the "slipper."

The stem or leaves of orchids are frequently thickened, thus serving as storage organs for water. The water supply of many orchids, on account of the habitat on trees and rocks, is very uncertain, and those thickened leaves or stems carry the plants safely through periods of drought. When the thickened stems are short, and round or oval, they are known as pseudobulbs.

Some orchids grow in the ground and are known as terrestrial. These are commonly found in temperate regions, where dangers from frost exist. The majority, however, are epiphytic, that is, they grow on trees, and are found in warm temperate and tropical regions. The number of species is between 6,000 and 7,000, of which about 150 are found in the United States. The two great centers of their occurrence are: in the new world, in northern South America, northward into Central America, and in the west Indies; in the old world, in India and the Malay region. A series of slides was then exhibited illustrating some of the common wild and cultivated forms.

B. O. DODGE,
Secretary